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# AIR COMMAND AND STAFF COLLEGE

## STUDENT REPORT

COST OF OFFICER RETENTION

VERSUS REPLACEMENT

MAJOR ALFRED P. MCCrackEN 84-1715

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**TITLE** COST OF OFFICER RETENTION VERSUS REPLACEMENT

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Submitted to the faculty in partial fulfillment of  
requirements for graduation.

**AIR COMMAND AND STAFF COLLEGE**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Presents an analysis of the costs involved in retaining an officer through retirement. These findings are compared to the cost of replacing the same officer if he were to leave the service at some career point short of retirement. The analysis is made for four Air Force officer career fields: pilot, navigator, engineer, and maintenance officer. The information is used to draw conclusions concerning present policy and to make recommendations for the future.		

## PREFACE

As the title suggests this is a study of the personnel costs involved with retaining or replacing Air Force Officers. The work is limited to the four career areas of pilot, navigator, engineer, and maintenance officer.

The project is divided into five chapters. Chapter one discusses the purpose behind the study, the significance of the problem, and the external and internal limitations placed on the analysis. Chapter two explains the rationale behind the present Air Force promotion system while citing the advantages of keeping the officer corps fresh with replacements. Chapter three looks at the need for experience in the Air Force and stresses the good points concerning retention. Chapter four is basically an analysis of the costs involved in the acquisition, training, ageing, and retirement of officers in each of the four investigated career fields. The final chapter summarizes the results of the analysis and organizes the findings into conclusions and recommendations.

This project was requested by Major William S. Morgan, a member of the Air Force Manpower and Personnel Center, Randolph AFB, Texas. Thanks are in order to Major Morgan and to his boss, Lieutenant Colonel Barry L. Barnes, for the able assistance they have contributed to this project.



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Major Alfred Patrick McCracken [REDACTED]

[REDACTED]. He received a Bachelor of Science degree in Mechanical Engineering from the University of Virginia in June of 1970, and he earned a Master of Arts in Management and Supervision from Central Michigan University in 1975. He entered the Air Force on February 2, 1971 and received his commission through the Officer Training School program in April of that year. After earning his pilot wings in May of 1972, Major McCracken was assigned to McGuire Air Force Base, New Jersey where he flew the C-141A strategic airlift aircraft. In addition to flying Major McCracken worked in several operations staff billets while at McGuire. He was then assigned to Clark AB, Republic of the Philippines where he flew the C-9A aeromedical airlift aircraft and worked for the 374th Tactical Airlift Wing Vice Commander as an exercise planner and as an investigator for the inspector general. His professional military education includes in residence completion of Squadron Officer School class 76A and resident attendance at the Air Command and Staff College class of 1984. Major McCracken has closely followed the retention issues of the Air Force since 1978, and he is an avid student of the American economy.

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## EXECUTIVE SUMMARY



Part of our College mission is distribution of the students' problem solving products to DoD sponsors and other interested agencies to enhance insight into contemporary, defense related issues. While the College has accepted this product as meeting academic requirements for graduation, the views and opinions expressed or implied are solely those of the author and should not be construed as carrying official sanction.

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**REPORT NUMBER** 84-1715  
**AUTHOR(S)** MAJOR ALFRED P. MCCrackEN, USAF  
**TITLE** COST OF OFFICER RETENTION VERSUS REPLACEMENT

I. Purpose: To present a cost analysis which will enable personnel planners to assess the costs involved in retaining, replacing, or removing officers in each of the four investigated career fields.

II. Problem: Cost reduction is a problem which became acute for the military with the inception of the all volunteer force. Finding the most cost effective way to manage the personnel end of the Air Force receives attention from the highest levels of government. Determining the costs involved in personnel acquisition, training, ageing, retirement, and benefits will contribute to a more informed decision making process.

III. Data: The need for a vital, young force and the desire to keep and promote only the very best officers are strong arguments in favor of the present Air Force promotion system. Although current Air Force policy allows for the continuation of some officers who have been passed over for promotion, the system is designed to eliminate those captains and majors who twice fail promotion to the next higher grade. There is a price to be paid for removal and replacement of skilled officers.



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## CONTINUED

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That price is paid in the form of lost experience and increased expenses for accession and training. For pilots and navigators the cost of continuous replacement and retraining far exceeds the expenses incurred by retaining an officer to retirement. The case for engineers and maintenance officers is not quite so clear cut. Certain replacement scenarios are less costly than some retention cases, however, the opposite is also true. Data is also provided which indicates the cost of retaining captains, majors, and lieutenant colonels for thirty years. This information is used in comparison to cost models which show the expense of replacement in various combinations.

IV. Conclusions: The analysis heavily favors retention of pilots and navigators when cost is the only consideration. The results for engineers and maintenance officers was relatively neutral. It also becomes important to take a new look at extending the continuation policy due to the significant savings which can be realized through program expansion.

V. Recommendations: The Air Force can reap great rewards by reducing accession and training costs. One way to do this is to require a longer commitment from all accessions. The recommended length of the contract is eight years. Another way to decrease training outlays is to allow more passed over officers to remain on active duty providing they are fully qualified. The most important recommendation is to use this study in combination with personnel surveys and feedback from the field to maximize the benefits of each.

## Chapter One

### INTRODUCTION

#### PROBLEM SIGNIFICANCE

A continuing problem facing Air Force leadership is manpower cost reduction. The particular focus of this project is to determine personnel costs associated with four typical Air Force officer career fields. The career areas chosen are: Pilot, Navigator, Engineer, and Maintenance Officer. The first three were chosen due to the high level of attention these career fields received in light of the retention and acquisition problems experienced by the Air Force in the late 1970's. The maintenance officer career field was chosen as representative of the personnel costs associated with the typical support officer. The statistics are applied to each career field so that replacement costs can be calculated for an officer who leaves the service at the six to eleven year point or for an officer who is forced out at the twelve to fourteen year point in his career. These costs are compared to the dollar figures for retaining an officer through retirement. Through fiscal comparison recommendations are presented which address retention, replacement, and reduction of personnel for each investigated career field.

The driving force behind this project is the Retention Working Group at the Air Force Manpower and Personnel Center (AFMPC). The working group has a requirement to continually update the factors which affect retention and replacement of personnel. Their interest in just such an analysis as this was intensified by recent Congressional attacks on the military retirement system. Allegations that military retirement pay is too generous and too costly for the nation require answers backed by analysis (11:3). Lieutenant General Kenneth Peek, Jr. best expressed the serviceman's opinion when he publicly proclaimed that the military retirement system is "viewed by our members as the most stable and enduring incentive for a military career" (9:1). Although this project is limited to four officer career fields the same analysis could easily be applied to any military career field. Another factor which influenced the subject of this study is the provision in the Defense Officer Personnel Management Act of 1980 (DOPMA)

which provides for the release (prior to retirement eligibility) of officers up through the grade of major who twice fail promotion (1:30-31). Although the Air Force presently has a limited continuation policy which allows some officers to remain until they are eligible for retirement, a fiscal analysis is necessary to determine the advisability of policy continuance.

These are only two recent factors which bear on the retention of a quality Air Force. However, the larger perspectives of the U.S. economy, work environment perceptions, and the area of pay and benefits must be considered in long range planning and projection (3:615-619). All of these factors require the common basis established by a retention vice replacement cost model, and that is the significant AFMPC interest which gave rise to this project.

### PURPOSE

High attrition rates for pilots and navigators in 1979 compared with high retention rates in 1982 and 1983 point to a "feast or famine" outlook for personnel planners.(7:2). The present Air Force pilot shortage coupled with an improving civilian economy and airline hiring estimates which indicate the current year need for as many as 4000 aircrew hires (nearly four times the 1982 hiring level) cause problems for the personnel system.(8:1). Although this project is not designed to predict future retention trends, this study represents a cost analysis which will enable planners to assess the costs involved in retaining, replacing, or removing officers in each of the four investigated career fields. The purpose of this project, therefore, is to compare the financial investment required to retain or replace an Air Force officer and to present recommendations in this area for each of the career fields.

### SOLUTION TECHNIQUE

The method used to establish the basic cost analysis depends on four factors. First, figures gathered must be verifiable in 1983 dollars. To accomplish this analysis figures (exceptions designated by asterisk and documentation cited) were taken directly from or were derived from statistics compiled in AFR 173-13. Second, an investment factor is applied to all replacement figures to account for losses in buying power not attributable to inflation. Third, an experience factor is applied to replacement figures to account for capability losses due to inexperience. Finally, several basic assumptions must be made which apply to the overall analysis (see limitations).

No preconceived ideas are applied to this study as it is primarily an objective treatment of costs associated with acquisition, training, ageing, and retirement of Air Force officers. The conclusions and recommendations are the thoughts of the author only and are not to be construed to be the position of the U.S. Air Force or any agency thereof.

### LIMITATIONS

There are two basic limitations to this study. They are: the source and, therefore, the accuracy of the figures used, and the assumptions which are intended to standardize the calculations for each career field. The first limitation is inherent in any statistical analysis. There are several ways to calculate life cycle pay, allowance, and retirement figures. For this study these amounts were determined by using the tables in AFR 173-13 which display average pay for each grade (17:36-37). These same computations were made using individual pay tables. The result was a much more complicated analysis which yielded total cost figures within ten percent of the numbers achieved by using average pay. A similar situation exists for the figures used to determine ageing costs. Large increases or decreases (up to a factor of one half the total ageing cost) in this figure results in less than a ten percent overall change in the life cycle cost to the Air Force. Therefore, the author is confident that any accurate set of statistics may be applied to this model, and the results will lead to similar conclusions.

The second limitation of this project defines the primary assumptions. They are listed here to give the reader an early indication of the scope and direction of the analysis.

- A. Relative economic stability for the U.S.
- B. Work force capable of producing officer replacements.
- C. Air Force Academy output remains constant.
- D. ROTC output remains constant with flexibility in type of degree offered.
- E. Officer separations will be considered only after the six year career point.
- F. Costs are figured in 1983 dollars.
- G. Annual cost of living pay increases will average at or below the inflation rate.

- H. Average retirement age of 43 for 20 year retirees; 48 for 25 year retirees; 53 for 30 year retirees.
- I. Average life expectancy after retirement is to age 70.
- J. The retained captain will be limited by the rank of lieutenant colonel.
- K. Investment opportunity cost (factor applied to training costs which are lost from hardware buying potential) is defined as the current interest rate minus the current inflation rate multiplied by the investment. Present percentage is (11% - 5%) or 6%.
- L. Experience factor is quantified as the difference in pay between an experienced and an inexperienced officer. (i.e. the Air Force is willing to pay a major an average annual salary of \$42,445 while they are only willing to pay a second lieutenant \$20,633. The major's experience is, therefore, worth \$21,812 with respect to the second lieutenant)(17:37).
- M. Promotion potential to grades above the rank of lieutenant colonel will not be increased.
- N. Deterrence continues to be successful thereby allowing the maintenance of a numerically stable force.

#### OVERVIEW

The balance of this study is divided into four chapters. Chapter two advocates the case for replacement of much of the Air Force officer corps. The advantages of a young, aggressive, competitive force are expounded upon. The third chapter takes the case for retention and describes the present conditions which have bolstered experience levels. This chapter also describes potential problems for future retention. Chapter four presents the cost analysis for the pilot, navigator, engineer, and maintenance officer career fields. The final chapter presents a summary and discussion of important findings and makes recommendations with regard to the analysis.

## Chapter Two

### THE CASE FOR REPLACEMENT

#### WHY REPLACE

The United States Air Force uses many different programs to maintain and to improve the capabilities of the officers who man the ranks. The initial testing and screening insures a mentally and physically sound input to the force (15: 39-41). The requirement also exists to maintain a youthful force with high standards of performance. The Air Force pursues this requirement through several quality force initiatives and a promotion system which is geared toward identifying and advancing the best qualified officers while eliminating those officers with marginal potential or substandard performance (12:16). The fact that productivity and capability are not always related to extensive experience or to military longevity must be considered when weighing force competence.(1:30). The following treatise will expound upon these elements as they relate to personnel replacement as a policy in the Air Force.

The Air Force continues to attract bright, healthy young people into its officer ranks. In fact, 1983 was the most successful recruiting year in the history of the all volunteer force (16:10). At this time there are no significant numerical shortfalls in any officer career fields except for the pilot and engineer areas. The new officer accessions are bringing skills in computer competence and other technology to an employer who is eager to use them. The Air Force has spent and will continue to expend valuable time and money to make today's officer corps computer literate. This capability already exists in many of the recent officer accessions due to increased emphasis at the college, high school, and even elementary school level on technical training. The high quality officer that we are getting today may be more difficult to recruit as the U.S. economy improves (16:10). The well studied opinion of the author is that the U.S. economy is in a period of transition from a recessionary period brought on by the demise of heavy industry to a period of economic boom brought on by conversion to a computer based high technology industrial economy. In this type of economy the talented

technician will demand a challenging job and a competitive salary. It is in the best interest of the country to continue paying the price for high quality and then to keep only the most qualified as well as those with the highest potential for leadership in the future (1:34-35).

### UP OR OUT

That brings us to the next subject which is the up or out promotion and tenure system which has been with us since the Officer Promotion Act of 1947 (1:30). Objections to this system can be categorized in two areas. Detractors accuse the system of lowering morale because of the selection process which fosters perceptions of promotion inequities and of inadequate job security (1:31). Others believe that this system encourages early retirement and, thereby, places an undue financial burden on the military. (2:65-66). To determine the accuracy of the allegations with respect to the value of the system, an examination of the Army promotion system prior to World War II is instructive.

In 1941 the Army had a promotion system based on seniority where officer grades came open only as the result of resignations or death (1:29). The effect of this policy was a stagnation in grade for junior officers and a very old general staff (1:29). At the termination of World War II hostilities, efforts were made to keep the Army from ever again creating an officer corps who were anything less than a professional and capable force. General Eisenhower testified before Congress on the inadequacies of the seniority system and the need for a more vital program for military promotion (1:30). The result of this effort was the Officer Promotion Act of 1947 which stipulated the separation of officers who failed selection for captain or major. It further required that those who failed promotion to lieutenant colonel or colonel would be required to retire after a specified number of years (1:30-31). DOPMA has continued the up or out requirement and expanded it in that majors may now be separated prior to retirement eligibility if they twice fail promotion to lieutenant colonel (1:31).

The present system makes competition for a limited number of promotions an important aspect of daily job performance. This competitive atmosphere is created to improve the overall quality of the officer corps (1:33). The up or out function serves not only to screen out the marginal performers, but it continues to evaluate the individual as he gains responsibility commensurate with a higher rank. At the next promotion point an individual who showed great promise as a captain but was marginal as a major can be eliminated (1:33-34). A very

important contrast can be made between the present military system and a security oriented system such as the U.S. Postal Service. This type of promotion system lacks the vitality of the present military system and suffers from many of the same ills apparent in the Army prior to World War II.

DOPMA allows the Air Force to promote and keep highly qualified officers while maintaining the option of retaining fully qualified (though not promotable) officers as service needs dictate. The most important functions of the present system are that "it provides a youthful and vigorous officer corps, and it permits orderly elimination of those officers less qualified" (1:35). These two factors allow continuous flow through the promotion system for new officers and high rank advancement for the best of them.



## Chapter Three

### THE CASE FOR RETENTION

#### WHY RETAIN

The requirement to maintain a core of highly skilled, highly motivated, highly productive, and highly dedicated professionals is nowhere more important than in today's technologically advanced Air Force. The task of defending the United States of America is a job for the brightest and best our nation has to offer. Our present promotion system (DOPMA) insures advancement of our most highly qualified officers and current policy provides continuation for fully qualified officers who are not selected for promotion. (1:35). This policy, although subject to short notice revocation, has allowed the Air Force to keep a significant number of experienced personnel who would normally be lost through the up or out system (2:65). Maintaining this policy is an important factor in the case for retention. It has a positive effect on the morale of younger officers who are concerned over job security and system inequities. (1:31).

Massive losses of pilots and navigators in the late 1970's cost the Air Force dearly in both experience and training expense to fill the vacated ranks. We are now in a period of high retention, and this situation could be exploited by "banking" experienced personnel in case of another mass exodus (16:10). Indications of an improving economy as well as work force demographics point to a shrinking work force in the 18-22 age group and increased competition from corporate managers who will also be after this population segment. (15:41). Increased retention rates reduce dependence on acquisition thereby reducing competition in the youth job market. Innovative ideas in the area of force stabilization may be the answer. Job enrichment, educational opportunity, enhanced pay, fair promotion prospects, and retirement security are all part of the military benefits package which must be addressed if we are to retain large numbers of qualified personnel for the future (5:41). How present Air Force leaders answer the assaults on Air Force member benefits will certainly affect readiness, retention, recruitment, and even the wartime capability of the force.

## PRESENT SITUATION AND POTENTIAL PROBLEMS

The present favorable atmosphere for keeping our best people in the service has been brought on by a combination of factors. The first of these factors is the increase in attention to defense needs by the present administration. This has had a positive effect on the image of the military as well as an overall positive impact on morale. Another factor has been improved pay which boosted Air Force salaries by over 30% in the past five years. This has been a very positive force for retention especially when considered in conjunction with the weak U.S. economy since 1980. The state of the economy is considered to be the single most important factor affecting retention (7:2). As the country entered the recession in 1980, the job market for high paying airline and middle management jobs began to erode. By 1981 even the market for technical expertise such as engineering was drying up. The bottoming of the recession in 1982 followed by the economic upturn in 1983 reveals a rapidly improving job market (8:1). It would be indeed unfortunate if the Air Force should experience large reversals in the retention progress of the past few years.

Retention problems have lagged economic upturns by several years, however, the Air Force has seldom managed these problems in terms of forecast losses but has managed based on recent losses and present shortages in specific career fields (e.g. engineer shortages in the 1970's (14:3) and pilot shortages in the early 1980's) (15:41). As the U.S. economy continues to improve, there could be more than a few big years of pilot hiring by the airlines. As their furlough pool draws down, they will increasingly turn to the military to supply the well trained pilots they need. Middle managers for industry will also be required, and the Air Force can expect recruitment to reach into the officer ranks. This is not a new phenomenon, but this time there is no excess of Vietnam era officers to "take up the slack" of industry hires. Forecasting potential shortages and taking positive action to minimize the loss of quality people is a challenge for mid-level and senior Air Force Leadership.

## Chapter Four

### ANALYSIS

#### PILOT CAREER FIELD

The following cost analysis is intended to present financial facts which will enhance management decision processes. The analysis shows the total investment (in 1983 dollars) made by the Air Force in an officer who separates (or is forced out) at the 6, 8, 10, 12, and 14 year points. This will be termed the replacement cost. The analysis will also list the total investment (including retirement cost) for officers who retire at the 20, 25, and 30 year points. This will be termed the retention cost. Retention costs have been figured for the grades of captain and major to provide comparative figures for the continuation proposition.

Pilot Acquisition Cost (OTS)	9,000
Pilot Training (UPT)	258,269
Post UPT Training to Full Qualification	400,000
Investment Opportunity Cost (Per Year)	40,036

#### Replacement Cost:

6 Year Loss .....	737,701
8 Year Loss .....	808,123
10 Year Loss .....	878,545
12 Year Loss .....	948,967
14 Year Loss .....	1,019,389

#### Retention Cost:

20 Year Retain (Retires as Lt Col)	1,810,678
(Retires as Maj)	1,702,079
(Retires as Capt)	1,570,178

Pilot Retention Cost (Cont'd):

25 Year Retain	(Retires as Lt Col)	2,066,411
	(Retires as Maj)	1,921,954
	(Retires as Capt)	1,752,548
30 Year Retain	(Retires as Lt Col)	2,276,381
	(Retires as Maj)	2,103,579
	(Retires as Capt)	1,903,470

NAVIGATOR CAREER FIELD

Navigator Acquisition Cost (OTS)	9,000
Navigator Training (UNT)	60,502
Post UNT Training to Full Qualification	100,000
Investment Opportunity Cost (Per Year)	10,170

Replacement Cost:

6 Year Loss .....	294,022
8 Year Loss .....	364,444
10 Year Loss .....	434,866
12 Year Loss .....	505,288
14 Year Loss .....	575,710

Retention Cost:

20 Year Retain	(Retires as Lt Col)	1,366,587
	(Retires as Maj)	1,257,988
	(Retires as Capt)	1,126,087
25 Year Retain	(Retires as Lt Col)	1,622,320
	(Retires as Maj)	1,477,863
	(Retires as Capt)	1,308,457
30 Year Retain	(Retires as Lt Col)	1,832,290
	(Retires as Maj)	1,659,488
	(Retires as Capt)	1,459,379

### ENGINEER CAREER FIELD

Engineer Acquisition Cost (Weighted Average) 37,500

In Unit Training Cost 12,172

Investment Opportunity Cost (Per Year) 2,980

#### Replacement Cost:

6 Year Loss .....	193,030
8 Year Loss .....	266,127
10 Year Loss .....	339,224
12 Year Loss .....	406,321
14 Year Loss .....	473,418

#### Retention Cost:

20 Year Retain (Retire as Lt Col)	1,247,080
(Retire as Maj)	1,138,077
(Retire as Capt)	1,015,619
25 Year Retain (Retire as Lt Col)	1,490,228
(Retire as Maj)	1,344,887
(Retire as Capt)	1,189,677
30 Year Retain (Retire as Lt Col)	1,687,613
(Retire as Maj)	1,513,447
(Retire as Capt)	1,332,286

### MAINTENANCE OFFICER CAREER FIELD

Maint. Officer Acquisition Cost (Weighted Average)	37,500
Maint. Officer Training Course *	14,024
In Unit Training Cost	12,172
Investment Opportunity Cost (Per Year)	3,822

#### Replacement Cost:

6 Year Loss .....	194,882
8 Year Loss .....	261,979
10 Year Loss .....	329,076
12 Year Loss .....	396,173
14 Year Loss .....	463,270

#### Retention Cost:

20 Year Retain (Retire as Lt Col)	1,236,932
(Retire as Maj)	1,127,929
(Retire as Capt)	1,005,471
25 Year Retain (Retire as Lt Col)	1,480,080
(Retire as Maj)	1,334,739
(Retire as Capt)	1,179,529
30 Year Retain (Retire as Lt Col)	1,677,465
(Retire as Maj)	1,503,299
(Retire as Capt)	1,322,138

\* Figure obtained from Chanute AFR Maintenance Officer School. Individual officer cost was for 1982. Inflation factor from AFR 173-13 was applied to figure cost in 1983 dollars.

All figures used in this analysis (except as noted by asterisk) were taken directly from or were derived from AFR 173-13.

## Chapter Five

### SUMMARY AND DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

#### SUMMARY AND DISCUSSION

Although every economic, military, and political possibility cannot be taken into account, this study assumes relative economic and political stability for the U.S. in the foreseeable future as well as the success of the present policy of deterrence through military strength. These and other assumptions in this study were made to provide a base from which to develop the analysis. The reality may be quite different, for, just as the Vietnam conflict, oil price hikes, and economic fluctuations of the 1970's contributed to the personnel problems previously noted in this study, the future has precarious potential. Regardless of the difficulties of the past and the unseen problems yet to come, it remains the responsibility of Air Force leadership to deal with these problems while continuing to provide the best possible defense for the nation. Long range, intermediate range, and near term personnel planning must fulfill this responsibility.

This project is dedicated to assisting the planning process by providing retention and replacement costs within a career field and by displaying relative costs between specialties. The Air Force has a need for field grade and general officers in virtually all career fields. The number of officers in each career field and for each rank is provided to personnel planners, however, the actual numbers vary widely from the requirements. This is due to the wide fluctuations in hiring practices over the past two decades. The large influx of rated officers during the Vietnam era followed by the post Vietnam draw down and mass exodus of the late 1970's created "bulges" which are difficult for personnel planners to force into a structured rank system. To get the system back in balance requires a close look at promotion quotas, the present policy of continuation, and possible reductions in certain career fields. The analysis provided by this study shows the cost of losing too many officers as well as the cost associated with retaining more officers than are necessary in each of the investigated career fields.

## CONCLUSIONS

Correct personnel management and retention policies provide a continuous flow of qualified officers into the higher ranks so that the lieutenant colonel who leaves the service is not replaced by a second lieutenant but by an experienced major (1:34). It is also important to remember that shortages in critical skills such as ~~were~~ experienced in the pilot ranks in recent years are in fact made up by second lieutenants, and the Air Force lives with the experience gap. How well the officer corps is prepared to meet future challenges will be determined by the planning decisions made by the personnel management force of today.

The following figures are derived from the analysis in chapter four. The figures will compare the life cycle cost of replacing an officer versus the cost of retaining that same officer through retirement (30 years will be used as the life cycle). In these cases no experience factor will be figured into the results. Three replacement cases are listed for each career field and two retirement cases are provided for the comparison. Each case describes a combination of replacements which covers a 30 year period. The reader will notice that compounding the investment opportunity cost results in extremely high replacement costs for the pilot career field.

### Cost of Pilot Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	6,542,860
Replace Every 10 Years .....	3,688,089
Remove at 14 Years/Replace Twice at 8 Years ..	3,405,821

### Cost of Pilot Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	2,980,779
30 Year Retirement (as Lt Col) .....	2,276,381
(as Maj) .....	2,103,579
(as Capt) .....	1,903,470

### Cost of Navigator Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	2,412,569
Replace Every 10 Years .....	1,744,113
Remove at 14 Years/Replace Twice at 8 Years ..	1,601,560



Cost of Navigator Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	1,914,410
30 Year Retirement (as Lt Col) .....	1,832,290
(as Maj) .....	1,659,488
(as Capt) .....	1,459,379

Cost of Engineer Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	1,312,211
Replace Every 10 Years .....	1,177,130
Remove at 14 Years/Replace Twice at 8 Years ..	1,112,353

Cost of Engineer Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	1,632,852
30 Year Retirement (as Lt Col) .....	1,687,613
(as Maj) .....	1,513,447
(as Capt) .....	1,332,286

Cost of Maint. Officer Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	1,402,151
Replace Every 10 Years .....	1,184,786
Remove at 14 Years/Replace Twice at 8 Years ..	1,120,575

Cost of Maint. Officer Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	1,622,232
30 Year Retirement (as Lt Col) .....	1,677,465
(as Maj) .....	1,503,299
(as Capt) .....	1,322,138

These figures were generated by the simple addition of costs associated with the given situations for each career field. The results for these cases lead to the conclusion that it is more cost effective to retain pilots and navigators to retirement, however, replacement of engineers and maintenance officers is the lower cost alternative. This would be an erroneous conclusion since a very important factor is missing in this evaluation.

The factor which was not accounted for in the previous example was experience, or, what will be referred to as the lack of experience factor. This factor will now be applied to all figures in the last example with the exception of the 30 year retirement case. This is because there is no loss of experience if an officer stays in the service for the entire 30 year life cycle. The exact worth of experience has seldom been given a specific value in past studies because the precise correlation of experience to correct decision making and, thus, to dollar savings has been a difficult factor to quantify. This study takes a different look at how to define experience. It is quantified here as the cost to the U.S. Air Force to retain an experienced officer versus the cost of an inexperienced or less experienced officer. The cost is the difference in pay between (for example) a major and a lieutenant to retain the experience of the major. The Air Force is, therefore, sacrificing that experience (i.e. that pay differential) when an experienced officer is lost and a younger officer with less experience takes his place. The Air Force must pay a premium for management and leadership experience. The present pay scale takes this into account. This study will only use this same pay scale to include a lack of experience factor in the recomputation of replacement costs for the previous examples.

Cost of Pilot Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	6,951,186
Replace Every 10 Years .....	4,005,455
Remove at 14 Years/Replace Twice at 8 Years ..	3,708,719

Cost of Pilot Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	3,167,309
30 Year Retirement (as Lt Col) .....	2,276,381
(as Maj) .....	2,103,579
(as Capt) .....	1,903,470

Cost of Navigator Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	2,820,895
Replace Every 10 Years .....	2,061,479
Remove at 14 Years/Replace Twice at 8 Years ..	1,904,458

Cost of Navigator Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	2,100,940
30 Year Retirement (as Lt Col) .....	1,832,290
(as Maj) .....	1,659,488
(as Capt) .....	1,459,379

Cost of Engineer Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	1,720,537
Replace Every 10 Years .....	1,494,496
Remove at 14 Years/Replace Twice at 8 Years ..	1,415,251

Cost of Engineer Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	1,819,382
30 Year Retirement (as Lt Col) .....	1,687,613
(as Maj) .....	1,513,447
(as Capt) .....	1,332,286

Cost of Maint. Officer Replacement Over a 30 Year Life Cycle:

Replace Every 6 Years .....	1,810,477
Replace Every 10 Years .....	1,502,152
Remove at 14 Years/Replace Twice at 8 Years ..	1,423,473

Cost of Maint. Officer Retention Over a 30 Year Life Cycle:

20 Year Retirement as Lt Col plus	
One 10 Year Replacement .....	1,808,762
30 Year Retirement (as Lt Col) .....	1,677,465
(as Maj) .....	1,503,290
(as Capt) .....	1,322,138

Now that an experience factor has been applied to the case figures, the retention option is attractive for all career fields when compared to the situation which requires replacement at six year intervals. Continuation of majors and captains to the 30 year retirement point also appears to be attractive from a strict monetary perspective. To explain more clearly how these figures were derived, there follows a sample of cost additives for the retention and replacement cases.

Sample Cost Additives for Retention to Retirement:

- Training and Acquisition Cost
- + Pay and Allowances Through 30 Years of Service
- + Retirement Pay
- Total Cost Over 30 Years

Sample Cost Additives for Replacement (e.g. Replace Every 10 Yrs.):

- 3 X Training and Acquisition Cost
- + 3 X Pay and Allowances Through 10 Years of Service
- + 6% (Compounded) Investment Opportunity Cost for Each  
Additional Training Requirement
- + Lack of Experience Factor
- Total Cost Over 30 Years

The most obvious conclusion which can be drawn from the cost comparison in the cases which included a lack of experience factor is that retention is less expensive in the aggregate. That is to say that in those instances where replacement is more economical than retention it is not preponderantly so. However, in the pilot example the cost of several replacements could be more than three times the cost of retaining one officer for the entire life cycle (a cost in excess of four million dollars).

The reason for displaying the figures in a thirty year life cycle is to show the considerable monetary saving which can be realized by continuing captains, majors, and lieutenant colonels to thirty years. To allow this to occur would require a change to the present law (DOPMA) so that tenure could be extended to thirty years for grades below colonel. A further broadening of the present continuation policy would also be required. Both of these points are politically sensitive as was discussed in previous portions of this text. The figures speak for themselves. Any combination of retention or replacement cases can be calculated. How to apply these facts and conclusions to future personnel challenges is the remaining topic for discussion.

RECOMMENDATIONS

The following recommendations are based on what the author considers to be the conservative findings of this analysis. The assumptions and factors applied to the figures in this study may not agree directly with the reader's viewpoint. However, this study was made so that any factors or numbers could be added, deleted, or changed (so long as they are

realistic with respect to the actual personnel costs involved) and the outcome of the analysis will be the same. What is the cost of lost investment opportunity? What is the real value of experience? This study quantifies (albeit conservatively) these factors. The recommended course of action should be the same regardless of the factors used.

The recommendation is that the Air Force should go to a longer contract for all officer accessions, particularly Air Force Academy, ROTC scholarship students, pilot, and navigator accessions where training costs are the highest. Any addition to the commitment significantly reduces life cycle costs in the form of additional training and accessions. An eight year contract would not seem out of line for the level and the expense of the training/education received.

The second recommendation concerns the DOPMA provision which requires officers below the rank of colonel to retire prior to thirty years' service. There is an alternative to the either/or proposition presented by those who champion seniority and by those who favor the up or out system. Some portion (certainly less than ten percent in the grade of major and lieutenant colonel) of those below the grade of colonel could be continued based upon merit and service needs. Records of those wishing to continue to the thirty year point would compete yearly for the limited number of slots. This would retain the best of the Air Force experience pool while reducing training and acquisition costs.

The final recommendation is to use this study in concert with personnel surveys and feedback from the field to best determine policy implementation. Although saving money is an ever important factor in any decision, it would be to the detriment of the Air Force and the nation if dollars are saved at the expense of readiness.

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